JAMES WIMSHURST, F.R.S.

WE regret to have to announce the death of Mr. James Wimshurst, F.R.S., which occurred at his residence on Saturday, January 3. Mr. Wimshurst was born in London in 1832 and was therefore in his seventy-first year. He was for a long time a surveyor with Lloyds', both in London and in Liverpool, finally becoming principal shipwright surveyor to the Board of Trade, which appointment he held until a few years ago, when he retired under the age rule.

Mr. Wimshurst was devoted to scientific pursuits, in which he spent the greater part of his spare time. At his private house at Clapham, he had a laboratory and workshop, which he had himself fitted up with the assistance of his two sons. It was here that he worked out the new designs in influence machines which have made his name familiar to every student of science. His attention was first turned to this subject about 1881, when he constructed a machine of the Holtz pattern, but embodying several important improvements. After about a year's work, he designed an influence machine with oppositely rotating glass discs bearing metal sectors on their outer faces, which he called a "duplex" machine, but which has been universally known since as "Wimshurst's machine." For many years, he continued perfecting this pattern of electrostatic generator, building larger and more efficient machines. These machines have displaced all other generators of static electricity on account of their possessing the property of being self-exciting under any atmospheric conditions; they are very largely used for experimental, X-ray and electromedical works.

In 1890, Mr. Wimshurst designed a machine capable of producing rapidly alternating charges of electricity. In the same year, he was elected a member of the council of the Physical Society. In 1898, he was elected a fellow of the Royal Society; he was in addition a member of many other scientific societies, including the Institution of Electrical Engineers and the Röntgen Society; he was also a member of the board of managers of the Royal Institution.

All Mr. Wimshurst's scientific research was done for pure love of the work, and he persistently refused to accept any pecuniary benefit from it. His advice and assistance were always at the service of those interested, and his long experience with influence machines made his advice invaluable and in frequent requisition.

NOTES.

WE are authorised by Prof. J. J. Thomson to contradict the announcement that he has accepted the chair of physics in Columbia University, U.S.A.

THE Geological Society of London will this year award its medals and prize funds as follows:—Wollaston medal to Prof. Heinrich Rosenbusch, of Heidelberg, Murchison medal to Dr. C. Calloway, Lyell medal to Mr. F. W. Rudler, Bigsby medal to Dr. H. M. Ami, of Ottawa, Prestwich medal to the Right Hon. Lord Avebury, Wollaston fund to Mr. L. L. Belinfante, Murchison fund to Mrs. Gray, and Lyell fund to Mr. George Edward Dibley and Mr. S. S. Buckman.

IN a letter to Wednesday's *Times*, Sir Norman Lockyer states that several months ago he discussed with Mr. Shaw, the secretary of the Meteorological Council, the desirability of obtaining information regarding barometric pressures from ships crossing the Atlantic, by utilising wireless telegraphy. It now seems probable that this idea will soon be practically realised, for in reply to an ethergram from Mr. Marconi, Sir Norman Lockyer asked for help in this matter, and on January 13 received the following message:—"By wireless telegraphy.—Thanks for suggestion, hope to be able to do so soon, big westerly gale here Monday.—MARCONI." Sir Norman remarks that all friends of Science will be grateful to Mr. Marconi for such generous and invaluable assistance which will undoubtedly be of enormous advantage to British meteorology.

THE article by Dr. J. C. McVail in another part of this issue (p. 254) directs attention to the present unsatisfactory position of the law relating to vaccination in England, and the need for educating and organising public opinion in support of a new Vaccination Act. At the end of the present year, the Vaccination Act of 1898 will have run its experimental course of five years, and the opportunity should then be taken to ensure the introduction of a new measure based upon scientific principles. It is to render assistance in this direction that the Imperial Vaccination League has been formed. A deputation of the League is to wait upon the President of the Local Government Board this week, and will place before him the principal points upon which legislation is needed in connection with vaccination, with particular reference to revaccination. Three sub-committees appointed recently by the League have reported upon the degree of immunity given by primary vaccination, the need for revaccination at the age of twelve years, the transfer of vaccination administration from Boards of Guardians to some authority charged with public health functions, and the preparation and supply of calf lymph. The deputation which will wait upon Mr. Long will doubtless refer to the conclusions of the sub-committees and will urge emphatically that legislation should tend in the direction suggested by them.

WE regret to announce the death of the Rev. Dr. H. W. Watson, F.R.S., author of standard works on mathematical and physical subjects, and of well-known treatises on the kinetic theory of gases.

WE notice with regret the announcement of the death of Dr. H. E. Schunck, F.R.S., distinguished by his researches in connection with the chemistry of colouring matters.

THE death is announced of M. Albert Hénocque, vice-president of the Paris Biological Society and assistant director of the laboratory of biological physics in the Collège de France. M. Hénocque was known for his work in connection with the spectroscopic examination of blood.

THE King of Sweden and Norway has, *La Nature* reports, conferred the Norwegian medal Til Beleenning (Pour le mérite) upon M. Berthelot in recognition of the work of the distinguished French chemist.

A REUTER telegram from Ashkabad states that a fresh earthquake occurred at Andijan at 11 a.m. on January 7. The shock was of a particularly violent character.

THE Royal Statistical Society has awarded a Guy medal in silver to Mr. R. H. Hooker, for his paper on the suspension of the Berlin Produce Exchange and its effect on corn prices, which was read before the Society on December 17, 1901.

LAFFAN'S AGENCY announces from New York that Mr. Henry Phipps has just given 250,000*l.* for the establishment of a hospital at Philadelphia for the study, treatment and prevention of tuberculosis. The Pasteur Institute in Paris will be the model for the new establishment, which, however, is to devote itself exclusively to tuberculosis.

AN International Fire Prevention Congress will be held in London on July 7–10 in connection with the International Fire Exhibition at Earl's Court.

THE *Times* correspondent at St. Johns reports that Lieutenant Peary has decided to make another attempt to reach the North Pole. He is looking for a suitable steamer for a voyage next summer.

A GENERAL exhibition, devoted to hygienic milk supply in all its branches, will be held at Hamburg on May 2–10, 1903. Applications by intending exhibitors should be made, not later than February 15, to the Geschafftstelle, 46, Kampstrasse, Hamburg.

THE Carnegie Institution has, says *Science*, granted 1600 dollars to Prof. E. W. Scripture, of Yale University, for the prosecution of researches on the voice; 5000 dollars to Prof. W. O. Atwater, for his work with the respiration calorimeter, and has also made grants, the amount of which is not reported, to the Peabody Museum of Yale University, and to send Dr. H. S. Conrad, of the University of Pennsylvania, to Europe to study varieties of the water-lily.

AN exhibition is being held in London of the results of what is described as a new process for the preservation of animal tissues, by the injection of a fluid, the composition of which is not made public. The process is said to afford a satisfactory method of embalming animal bodies and of preserving museum specimens in a condition closely resembling life. The period which has elapsed since the application of the process to the various preparations exhibited is said by the inventor to range from a few weeks to thirty years.

A WRITER in the *Times* of January 7 suggests that wireless telegraphy should be used for sending time-signals from Greenwich and other places at definite instants, so that they could provide a means of determining longitude on ships having instruments capable of detecting the signals, or for regulating clocks or chronometers. The same suggestion was made by Mr. John Munro in NATURE of August 28, 1902 (vol. lxvi. p. 416), and the idea has doubtless occurred to others. Another writer, in Saturday's *Times*, suggests that some steamers crossing the Atlantic should be equipped with instruments for sending wireless messages as to meteorological conditions in mid-ocean, so as to provide material for weather forecasts and warnings.

REUTER'S AGENCY announces that the British and German Governments have decided on the immediate dispatch to West Africa of a mixed commission to demarcate the boundaries laid down by the Anglo-German Agreement of 1893. The frontier which is now to be fixed is that from the southern shore of Lake Chad to Yola, a distance of some 300 miles. The commissioners will proceed up the Benue direct to Yola, where they hope to arrive by the end of March, and will then work their way along the frontier to Lake Chad and, after fixing the position of Kuka, will return by the same route. The work is expected to occupy about a year.

WE learn from the *Lancet* that Dr. Michael Grabham, of Jamaica, a zealous exponent of the West Indian Culicidæ, is at work upon the mosquitoes of the Atlantic islands and has already obtained interesting results. The Azores have yielded no specific forms of any interest, but from the Madeiras he has sent to the British Museum four or five new varieties of culex in addition to one or two already well known and described. Dr. Grabham has found at Teneriffe, on the south side, a small anopheles identical with, or allied to, the malarial insect of the west coast of Africa. He has found also the same mosquito as is concerned in the spread of yellow fever at Havana.

IN a letter from Dr. Logan Taylor, the leader of the Sierra Leone expedition of the Liverpool School of Tropical Medicine, reference is made to the progress of the expedition in Sierra Leone. A very decided absence of anopheles larvæ in places where it was formerly easy to get any number has been noticed, and is due to their not being able to breed owing to the pools being either swept out or oiled regularly. Compared with the corresponding time last year, in some of the notoriously bad streets, where in a single house as many as six, seven or a dozen anopheles mosquitoes could be found in the early morning, this year, after searching house after house with great difficulty, one, or perhaps two, adult insects alone were discovered. Since the members of the Liverpool School expedition stopped clearing up yards and emptying out the water containing culex larvæ, no one else has taken up the work, and these insects are getting bad again, and unless the Government or the school will keep on the work, the money the school has spent on it will be almost thrown away.

THE copy of Sowerby's "English Botany" Supplement in the library of the Royal Botanic Gardens, Kew, is incomplete, wanting plates 2912 to 2960, with letterpress and index, also plates, with letterpress, 2964, 2977, 2978, 2983, 2987, 2988 to 2999. The director appeals to the public to assist him in completing this classical work on British botany, either by presentation or sale.

A NEWLY issued part of the "Conspectus Faunæ Grönlandicæ," which is now being prepared by the naturalists of Copenhagen, relates to the mammals, and has been written by Mr. Herluf Winge. The known mammals of Greenland are stated to be thirty in number, but sixteen of these are Cetaceans. On land there are two rodents (the polar hare and the lemming) and two ungulates (the reindeer and the musk-ox) found in Greenland, but the remaining ten are all Carnivores, of which four only are terrestrial and six are marine, *i.e.* seals. The four terrestrial mammals are the Arctic fox, the wolf, the polar bear and the stoat or ermine.

IN the *Sitzungsberichte der niederrheinischen Gesellschaft* (Bonn), Herr Constantin Koenen discusses the age of the human remains of the Neanderthal. The first of these, known as "Homo neanderthalensis I.," is referred to the second epoch of the Quaternary Palæolithic period, or "Moustèr's epoch," and the second form, "Homo neanderthalensis II.," to a somewhat later period.

MR. LOUIS BEVIER'S paper on the vowel I (as in pique), forming one of a series of papers on the various vowel sounds in the *Physical Review*, leads to the conclusion that the sound of I is characterised by a powerfully reinforced upper partial at some pitch generally lying between 1900 and 2500, usually nearest the value 2500, a chord tone which is generally present with a much larger amplitude than for the more open vowels, and beyond these two tones comparatively little intermediate resonance. The latter peculiarity seems to give the vowel its peculiar thin tone. It appears that the American I is more open than the German, and its characteristic upper partial lower pitched. The author proposes to present, in the course of time, similar studies on the labio-gutteral vowels from A to U.

IN the Cracow *Bulletin*, No. 8, Dr. Ladislaus Natanson discusses from a mathematical standpoint the problem of the deformation of a thin cylindrical disc of plastico-viscous material under the action of normal pressure on its opposite faces. The investigation bears directly on Von Obermeyer's experiments. In connection with the question as to how far a plastic solid is representable as a viscous fluid, an interesting idea is introduced. If we imagine it possible for the pressure on the disc to be varied in such a way as to maintain the disc of constant thickness, then, according to the theory considered by Dr. Natanson, the pressure would be an exponential function of the time, the modulus of decay and therefore also the time of relaxation being finite. For a viscous liquid, on the other hand, the time of relaxation vanishes. From experiments such as those of Von Obermeyer, Dr. Natanson considers it possible to determine both the "coefficient of internal friction" and the time of relaxation.

IN the third part of the *Beiträge zur Psychologie und Philosophie*, Dr. Götz Martius gives a detailed investigation on the duration of light sensations. It is pointed out that "Talbot's Law," while defining the limits within which intermittent sources of light give rise to a uniform light-sensation of mean intensity, gives no information as to the actual duration of the light-sensation itself. Dr. Martius, after describing an apparatus used by Prof. Exner, gives an account by Karl Minnemann of a new light interrupter. It appears that the time which elapses before the sensation is a maximum depends on the intensity of the stimulus, decreasing in general as the intensity increases, while the duration of the sensation depends both on the intensity and on the duration of the stimulus. A discussion of the bearing of the actual results on kindred investigations such as those of Charpentier and Shelford Bidwell is noteworthy.

A SOMEWHAT remarkable attempt to trace points in common between such apparently different subjects as biology and education is made by Prof. Leopoldo Maggi, writing in the Lombardy *Rendiconti* in a paper entitled "Tachygenesis and University Studies." Both in the vegetable and animal kingdoms, it is pointed out that in the transition from the lower to the higher forms there is a continuous acceleration in the development of maturity, and this law of embryonic acceleration, which, following E. Perrier, the author describes as Tachygenesis, is an inevitable consequence of the struggle for existence. The same laws may be applied to social life, and it is suggested that they tend to bring about a reduction of the time given to university study in the lifetime of a man, but against this tendency there is the at present insuperable barrier opposed by regulations which fix the number of years required to complete the university courses. The new university regulations in Italy have reduced the minimum number of lectures in any course from about seventy to fifty, and this the author considers a good reason for reducing the length of the qualifying period for the university degrees. Prof. Maggi suggests several other applications of biological principles to allied social problems.

AN interesting article on the transmission of vision to a distance by electricity is contributed by Lieut. J. H. Coblyn to *L'Éclairage Électrique* for December 27. The author reviews briefly the theoretical aspect of the subject and the attempts which have been made at its practical solution. He suggests that some less sluggish transmitter than a selenium cell may have to be sought before satisfactory results are obtained, and as receiver proposes the use of a Blondel oscillograph, the moving part consisting of a tube which, as it is deflected, cuts off more or less of the light from a source of constant intensity. This is a modification of the method of Ayrton and Perry; another method proposed by M. Weiller is to use a sensitive flame the intensity of which is varied by a telephone diaphragm actuated by the transmitted current. In addition to the problem of reproducing the intensity of the illumination, a satisfactory solution has to be found to the difficulty of exploring the object and image synchronously at transmitting and receiving stations as the whole surface has to be covered in less than one-tenth of a second, the time of duration of the retinal impression. The author concludes that the problem is still surrounded with great difficulties.

Symons's Meteorological Magazine for December last contains a climatological table for the British Empire for 1901, so far as it can be shown by nineteen representative stations, but it is not claimed that the records quoted furnish more than a few useful samples of the various climates included in the British dominions. The highest temperature in the shade was 110° at Adelaide, in February. A new station has been included, viz. Dawson, where a temperature of -.50° in the shade was recorded in December, but the observations are incomplete. The highest mean temperature was 82°·1 at Colombo, and the lowest 36°·4 at Winnipeg. The driest station was Adelaide, mean humidity 59°, and the dampest Colombo, mean humidity 82°. The highest temperature in the sun was 168°, at Trinidad. The greatest rainfall was 114 inches, at Lagos, and the least 18 inches, at Adelaide. None of the extremes referred to can claim distinction as "records," but at individual stations the sun temperatures at London, 139°·8, and at Malta, 162°·9, are the highest observed there, and at London the number of rainy days, 128, is the lowest since these interesting tables were commenced.

THE latest issues of the *Bulletin* of the Entomological Division of the U.S. Department of Agriculture include the *Proceedings* of the fourteenth annual meeting of the Association of Economic Entomologists and some miscellaneous results of the work of the division. In the former, attention is called to the magnitude of the injuries inflicted by insects on the forests and forest-products of the United States, and the crude condition of our knowledge relating to the life-history of the insects in question. It is urged, therefore, that the work of the division is one of great and increasing importance.

THE first part of vol. vii. of the *Anales* of the National Museum of Buenos Aires contains a memoir, with portrait, of the late Dr. C. Berg by Señor A. Gallardo. In the same issue, Señor A. Mercerat describes a very imperfect skull of a toxodont from the pampean formation of Azul, which is regarded as representing a new genus and species, under the name of *Carolibergia azulensis*.

WE have received from the director, Captain S. S. Flower, a copy of a handy little guide (with plan) to the Zoological Gardens at Giza, near Cairo. The general introduction is written in English, French and German, and the names of the animals are given in several languages. The issue of this guide may be taken as an indication that the institution under Captain Flower's charge is in a satisfactory and progressive condition.

THE latest issue, vol. lxxiii. part i., of the *Zeitschrift für wissenschaftliche Zoologie* contains three papers, all of a highly technical nature. In the first, Herr Max Abel treats of regeneration among the oligochætous worms; in the second, Herr J. Müller discusses our knowledge of the land planarians of the family Bipaliidæ; while in the third, Herr K. Hann describes the development of the common hydromedusan *Clava squamata*.

IN the December number of the *Zoologist*, Mr. F. Coburn describes and figures a specimen of the British wild goose named *Anser paludosus* by Strickland in 1858. The type of that form has been generally regarded as an old male of the bean-goose (*A. segetum*); but a specimen obtained in 1896 by him at St. Abb's Head, Scotland, leads Mr. Coburn to conclude that it is a perfectly valid species, characterised by its large size, long neck and large feet, as well as by its aquatic habits. Apparently the bird was well known to the Yorkshire "carr-men" and "marsh-men" half a century ago, but no examples are known to science save the type and the one procured by Mr. Coburn. Where can be the habitat of this apparently distinct species is now the question.

THE first three parts of the second volume of the *Records* of the Botanical Survey of India have been issued. Mr. J. J. Wood has compiled a list of plants mainly from the province of Chutiá Nagpur. This part includes a map of the district and two sectional diagrams. Mr. Gammie has recorded the results of his investigations into plants used during periods of drought. For the purpose of making bread, seeds of species of Indigofera, Cyanotis and Panicum are used. Other sources of nourishment are the leaves of Amarantus, Rivea and Leptadenia. A systematic enumeration of the species of Calamus and Dæmonorops, by Mr. O. Beccari, is based mostly on plants growing in the Malayan Peninsula and the adjacent islands, and only a few species belong to India or Ceylon.

AN addition to our knowledge of semiparasitic plants is made by Mr. S. Kusano, who contributes the result of his studies on *Buckleya quadriala*, a genus of the Santalaceæ, to the *Journal* of the College of Science, Tokio. The plant was found growing naturally on several hosts, some Dicotyledons and some Gymnosperms, but a decided preference and better development was displayed on the roots of Abies and Cryptomeria. The haustoria arise laterally in the young stage, but eventually appear to originate from the apex, or in reality in close proximity to the apex. A feature which has only been suggested for allied genera, *e.g.* secondary growth due to cambium, is in Buckleya so marked that the contour of the vascular strand is entirely changed and definite medullary layers become differentiated. Since the cambiums are adjacent and develop tissue to the same degree, the sucker keeps pace with the growth of the host root.

A BRIEF critical review of the theories relating to plant evolution, more particularly the origin of new forms, is offered by Prof. Schwendener in a recent number of the *Naturwissenschaftliche Wochenschrift*. The article touches upon the origin of species by natural selection, the variations developed as special adaptations due to environment, the mutation theory and incidentally the production of hybrids. The arduous experimental work of De Vries and the possibilities of mutation or heterogenesis are acknowledged and accepted, but the opinion is expressed that new forms have not all originated after the same manner and that the direct action of external conditions has undoubtedly played an important part in the production of new and the modification of acquired characters. Prof. Schwendener is in accord with Darwin's theory of selection so far as it is limited to the origin of cultivated races of plants and to the breeding of domesticated animals, but does not believe in its application under natural conditions. This view, which coincides with the expressions of other eminent German botanists, naturally tends to diminish the importance previously attached to the theory of natural selection, but the writer pays just tribute to the value of Darwin's work, "whose service it was," he says, "to set on a new foundation the doctrine of descent, and after a struggle which was victoriously pursued to establish the idea permanently in biological science."

PROF. F. FRECH contributes to the *Zeitschrift der Gesellschaft für Erdkunde* (Nos. 7 and 8) a series of studies of the climates of past geological times. He accepts the views of Arrhenius with regard to the effect of variations in the amount of carbonic acid gas in the atmosphere, and considers the changes in the distribution of land and sea as the factor of next importance. The review of the geological evidence is interesting and important, but the author hardly gives sufficient prominence to physical aspects of the question, especially the effect of changes of temperature distribution on the atmospheric circulation and the influence of oceanic currents upon climate. The maps of continents and seas at the end of the Carboniferous period and of Europe during the Glacial period are valuable.

TWO more volumes of the excellent *Scientia* series of scientific monographs published in Paris by M. C. Naud have reached us, viz., "Le leucocyte et ses granulations," by Dr. C. Levaditi, and "Les phénomènes des métamorphoses internes," by Dr. J. Anglas. The volumes fully maintain the high character of preceding books in this series.

THE Orient Steam Navigation Company announce the commencement of their 1903 season of pleasure cruises. No. 1 cruise, starting February 26, is to the Riviera and on to Palestine, calling *en route* at Tangier, Palma, Sicily, Crete and Cyprus, returning home by way of Alexandria, Naples, Algiers and Gibraltar. The second cruise, leaving London March 14, is to Tangier, Malaga, Nice, Palermo, Crete, Smyrna and Constantinople, visiting on the return voyage the Piræus (for Athens), Nauplia, Katakolo (for Olympia), Naples, Algiers and Gibraltar.

THE reversible transformation of ammonium thiocyanate into thiourea has recently been investigated on a large scale by Reynolds and Werner, who give an account of their experiments in the *Journal* of the Chemical Society. At temperatures from 170°–180° C., the fused product obtained by heating either ammonium thiocyanate or thiourea for a sufficient time consists of 75 per cent. of the former and 25 per cent. of the latter. It is believed by the authors that the reversible change is partly conditioned by the greater stability at this temperature of a complex compound consisting of three molecules of thiocyanate and one molecule of thiourea.

THE first number of vol. i. of the *Biochemisches Centralblatt* has just been published. In twenty-eight pages it gives abstracts of some sixty papers dealing with subjects which belong essentially to the borderland of chemistry and medicine. It is pleasing to note that a considerable number of these are auto-abstracts, for this method of summarising is the only one which ensures that the really essential points in the various investigations are brought forward. The issue also contains a short summary by N. Zuntz of the recent work which has been carried out in America on such an elaborate scale by Atwater and his co-workers on the metabolism of the animal body. To physiological chemists, the *Centralblatt* will no doubt prove of considerable value, serving, as it is intended to do, for the collection of reports on all published medico-chemical investigations.

THE much-discussed question of the relationship between the red and yellow oxides of mercury may now be regarded as definitely decided. The experiments which lead to this conclusion form the subject of a paper by K. Schick, published in the last number of the *Zeitschrift für physikalische Chemie*. The results indicate that Ostwald's view that the difference between the two oxides is merely due to a difference in the size of the particles is the correct one, and that the older hypothesis, according to which the oxides are isomeric, is no longer tenable. Determinations of the solubility of the pure oxides in pure water at 25° C. show that they have practically the same solubility. Of the yellow oxide, one part dissolves in 19,300 parts of water, and one part of the red oxide in 19,500 parts. Such a small difference is due, in all probability, to the difference in the size of the grains.

THE current number of the *Zeitschrift für physikalische Chemie* contains an interesting paper by Dr. M. Wildermann on chemical dynamics and statics under the influence of light. The author's object has been to ascertain, if possible, the law which regulate the velocity of chemical change and the condition of chemical equilibrium, when such change is conditioned by the introduction of light energy into the system. In other words, it was proposed to investigate whether the velocity is proportional to the amount of light absorbed in unit time independent of the concentrations of the reacting bodies. The special chemical change which has been studied is the union of carbon monoxide and chlorine, a reaction which takes place only under the influence of light. A theoretical discussion of the experimental results leads the author to conclude that the velocity of a chemical reaction which is brought about (or influenced) by the introduction of light energy follows the same law in the light as in the dark. In the latter circumstances, the only active forces are those of chemical affinity. The influence of the light energy is therefore quite different in its effect upon the reacting substances from that of electrical energy, the effect of the latter being regulated, of course, by Faraday's law.

THE additions to the Zoological Society's Gardens during the past week include a Bennett's Wallaby (*Macropus bennetti*) from Tasmania, presented by Lady Boord; a Spotted Salamander (*Salamandra maculosa*) from Italy, presented by Mr. G. Bottini; two Bennett's Wallabys (*Macropus bennetti*) from Tasmania, a White-fronted Amazon (*Chrysotis albifrons*) from Cuba, three Ring-necked Parrakeets (*Palaeornis torquatus*, var), a Gangetic Trionyx (*Trionyx gangeticus*) from India, a Ruff (*Machetes pugnox*), a Skylark (*Alauda arvensis albino*) British, a Himalayan Monaul (*Lophophorus impeyanus*) from the Himalayas, deposited.

OUR ASTRONOMICAL COLUMN.

NEW VARIABLE STAR 21, 1902, SAGITTÆ.—From photographs taken by M. S. Blakjo at Moscow, Madame Ceraski has found that the star having the position

$$1855\ \alpha = 20\text{h. } 13\text{m. } 47\text{s.},\ \delta = +20^\circ\ 39'\cdot0,$$
$$1900\ \alpha = 20\text{h. } 15\text{m. } 46\text{s.},\ \delta = +20^\circ\ 47'\cdot3,$$

is a variable.

The magnitude varies from 9·5 to 11·5 or a little more, and M. Blakjo believes the period to be a long one, perhaps several weeks or months. In September, the actual visual magnitude was 11·5 (*Astronomische Nachrichten*, No. 3836.)

"THE HEAVENS AT A GLANCE," 1903.—The seventh yearly publication of this handy card is full of useful astronomical information for amateur observers. In addition to the usual monthly "Celestial Diary," tables of "Sidereal Objects" and "Descriptive Notes," it contains two small star charts which will be found very useful. The card may be obtained from its compiler, Mr. Arthur Mee, Llanishen, Cardiff, price sevenpence, post free.

OBSERVATIONS OF LONG-PERIOD VARIABLE STARS—In Nos. 3835-6 of the *Astronomische Nachrichten*, Father Esch, S.J., of Valkenberg, gives the detailed results of his observations of seventy-eight long-period variables. The objects are denoted by their names and numbers in Hagen's "Atlas Stellarum Variabilium," and the dates of their maxima, with the amount of variation from the elements given in the Atlas, are given, together with their range of variability and remarks by the observer.

OBSERVATIONS OF OCCULTATIONS—Mr. G. W. Hough, director of the Dearborn Observatory, gives the details of his observations of ninety-one occultations of stars by the moon, during the years 1900 and 1901, in No. 528 of the *Astronomical Journal*.

He divides the phenomena into four classes, and in the fourth class he places those in which the star appears to be projected on the earth-like disc of the moon for some seconds before the final disappearance; he explains this phenomenon by suggesting that, as the edge of the moon is not a smooth outline, the star may pass behind the moon at a point where there is a depression in the limb and so appear to be projected beyond the geometrical outline of that limb.

In the case of the occultation of the star D.M. + 20° 807 on February 25, 1901, the star apparently disappeared and the time was recorded, but it was seen again and a second record made 3·8 seconds after the first. This phenomenon was undoubtedly due to the reduction in light of a close double when the one component had passed behind the limb, for the object was afterwards identified as Ho 332, $p = 125^\circ\cdot9$, $s = 1''\cdot03$, 9m.–9m.

The phenomenon observed on the occultation of the star S.D.M. – 20°·4810, on October 17, 1901 ($p = 106^\circ$), belonged to the fourth class mentioned above, for the star appeared to be projected on the limb of the moon two or three seconds before its disappearance.

THE VACCINATION ACTS.

THE present position of the law relating to vaccination in England is indefensible. There is probably no great question in the domain of medicine on which the medical profession are nearer to absolute unanimity than that of the value and necessity of vaccination as a protection against small-pox. Independently of professional authority, perhaps no medical doctrine has for its basis so great an amount of statistical evidence gathered over so wide an area for so long a time This unanimity of belief and this statistical evidence are equally strong and of equal value as regards the primary vaccination of infants and the revaccination of adolescents.

It is not the purpose of this paper to cite any of the evidence in question. What the writer desires to point out here is that the existence in this country of Acts of Parliament making vaccination of children obligatory, or even providing expensive administrative machinery for the vaccination of persons voluntarily asking for it, must be taken as proof that Parliament accepts the conclusion that vaccination prevents small-pox. But the legislature is in the strange position of insisting on infantile primary vaccination and of making no requirement whatever regarding revaccination. At one time, and indeed up to a comparatively recent date, this attitude was defensible, for the great mistake of Jenner's life was that he believed a single vaccination to be sufficient for permanent protection, and the veneration naturally entertained for his name and work probably delayed general recognition of the need for repetition of the operation. That need, however, has now long been recognised, and the experience of Germany shows that vaccination in infancy and a single revaccination at a proper interval afterwards are sufficient to confer national protection against small-pox, though no doubt in any such protected nation or empire there will be individuals who owe their freedom from small-pox more to their being surrounded by a vaccinated and revaccinated population not liable to epidemics than to the permanence of their own personal immunity. No argument can be used in favour of a law of primary vaccination which is not also valid for a law of revaccination. If there is any reason for having no Revaccination Act, the same reason exists for having no Vaccination Act at all. Both should stand or fall together.

The importance of a Revaccination Act for England was prominently but unsuccessfully brought before Parliament when the law was being altered in 1898 by the passing of the temporary Act which came into force at the end of that year. The main features of that measure were the provision of domiciliary vaccination and the much-debated Conscience Clause. The Act was passed experimentally only for a period of five years, and comes to an end on December 31, 1903. Next session is practically certain to see one of two alternatives adopted by Government. Either new legislation will be introduced or the Act of 1898 will find a place in the Expiring Laws Continuance Bill. This latter course would shelve several questions which cry out for solution and ought not to be shelved. To prevent its adoption and to help Government to frame any new measure on the best lines are among the principal reasons for the formation of the Imperial Vaccination League, the first meeting of which was held in London lately under the chairmanship of the Duke of Northumberland. The League has other important objects before it. It desires to educate and interest the public generally in the subject of vaccination and revaccination. As concerns legislation, it has under consideration by separate subcommittees the questions of a Revaccination Bill, the supply of lymph prepared by Government or under Government supervision for the needs of the whole country, and the question of the proper local authority for the administration of the Vaccination Acts. The last of these, though an important administrative subject, is after all of much less public moment than the two others—the protection of the lymph supply and obligatory revaccination.

The risks attached to arm-to-arm vaccination in this country were greatly overstated by anti-vaccinationists. In no class of the population was arm-to-arm vaccination more uniformly resorted to than in the families of medical men, and the Royal Commission, which sat for the long period of seven years, concluded, after elaborate inquiry, that the risks were insignificant and were diminishing. Nevertheless, they recognised that the fear of injury from vaccination and especially the fear of syphilitic inoculation was a potent factor in hindering people from securing the protection of their children against small-pox.